

### 6.2 Bisectors of Triangles CYU

Use when you get it right all by yourself

**S** Use when you did it all by yourself, but made a silly mistake

**H** Use when you could do it alone with a little help from teacher or peer

**G** Use when you completed the problem in a group

**X** Use when a question was attempted but wrong (get help)

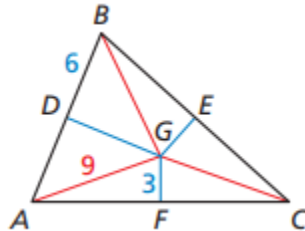
**N** Use when a question was not even attempted

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Properties of Perpendicular Bisectors	1	2	
Properties of Angle Bisectors	3	4	
Locating the circumcenter given vertices		12	5 - 7
Incenter properties of a triangle	8, 9	10	11, 13
Drawing special segments		12	13
Drawing a circumscribed circle about a triangle			12
Sometimes, Always, or Never			14 - 17

The perpendicular bisectors of  $\triangle ABC$  intersect at point  $G$  and are shown in blue. Find the indicated measure.

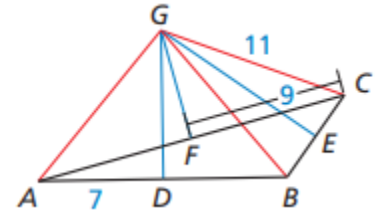
1. Find  $BG$ .

Blue:  $DG, GF, GE$



2. Find  $GA$ .

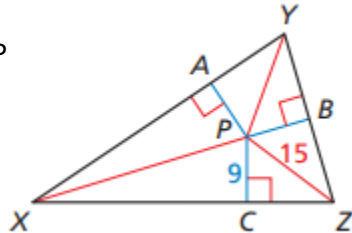
Blue:  $GE, GD, GF$



The angle bisectors of  $\triangle XYZ$  intersect at point  $P$  and are shown in red. Find the indicated measure.

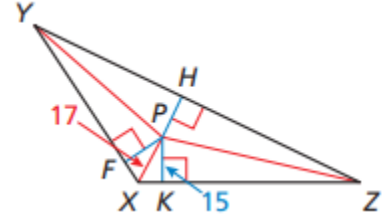
3. Find  $PB$ .

Red:  $PY, ZP, XP$



4. Find  $HP$ .

Red:  $PY, ZP, XP$



Find the coordinates of the circumcenter of the triangle with the given vertices.

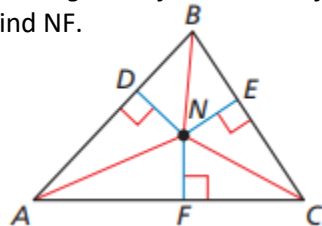
5.  $A(2, 6), B(8, 6), C(8, 10)$

6.  $D(-7, -1), E(-1, -1), F(-7, -9)$

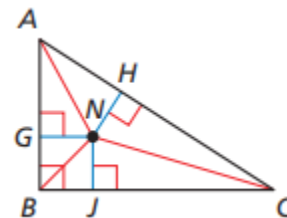
7.  $H(-10, 7), J(-6, 3), L(-2, 3)$

$N$  is the incenter of  $\triangle ABC$ . Use the given information to find the indicated measure.

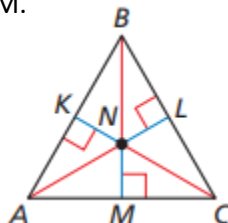
8.  $ND = 6x - 2$ ,  $NE = 3x + 7$ , Find  $NF$ .



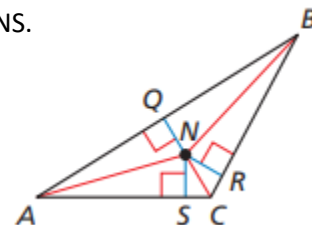
9.  $NG = x + 3$ ,  $NH = 2x - 3$ , Find  $NJ$ .



10.  $NK = 2x - 2$ ,  $NL = -x + 10$ , Find  $NM$ .



11.  $NQ = 2x$ ,  $NR = 3x - 2$ , Find  $NS$ .



12. Draw an obtuse triangle. Find the circumcenter by drawing the three special segments. Then draw the circumscribed circle.

13. **MODELING WITH MATHEMATICS:** You are placing a fountain in in a triangular koi pond, like at the Potosi Brewery. You want the fountain to be the same distance from each edge of the pond. Where should you place the fountain? Explain your reasoning. Use a sketch to support your answer.



*SOMETIMES, ALWAYS, or NEVER. Provide a counterexample if the answer is not always.*

14. The circumcenter of a scalene triangle is \_\_\_ inside the triangle.

15. If the perpendicular bisector of one side of a triangle intersects the opposite vertex, then the triangle is \_\_\_ isosceles.

16. The perpendicular bisectors of a triangle intersect at a point that is \_\_\_ equidistant from the midpoints of the sides of the triangle.

17. The angle bisectors of a triangle intersect at a point that is \_\_\_ equidistant from the sides of the triangle.

**CYU Reflection:** How far can you go: basic, intermediate, or advanced?

**Rate your mastery level!**

How confident are you with the skills this CYU covered? Circle the score you would give yours elf.

1    2    3    4    5    6    7    8

1 2   3 4 5   6 7   8

Basic                      Intermediate                      Advanced      Solved ALL!

